



Welcome to the 2016 RiverWare User Group Meeting

August 23-24, 2016

2016 Sesquiennial RiverWare User Group Meeting

- Hear about interesting applications
- Find out about new/upcoming enhancements and the future of RiverWare
- Meet other users and network
- Get to know the CADSWES Team
- Ask those burning questions
- Voice your opinion about what is needed or what you like/don't like



2016 RiverWare User Group Meeting

- **Introductions**
- **Announcements and Logistics**
 - Agenda and speaker guidelines, mics, questions, timekeeping
 - List of Enhancements
 - Lunch and breakout space
 - Photographer
 - Happy Hour
 - Open Mic, needs/ issues/ questions/ group discussion,
- **News and updates**



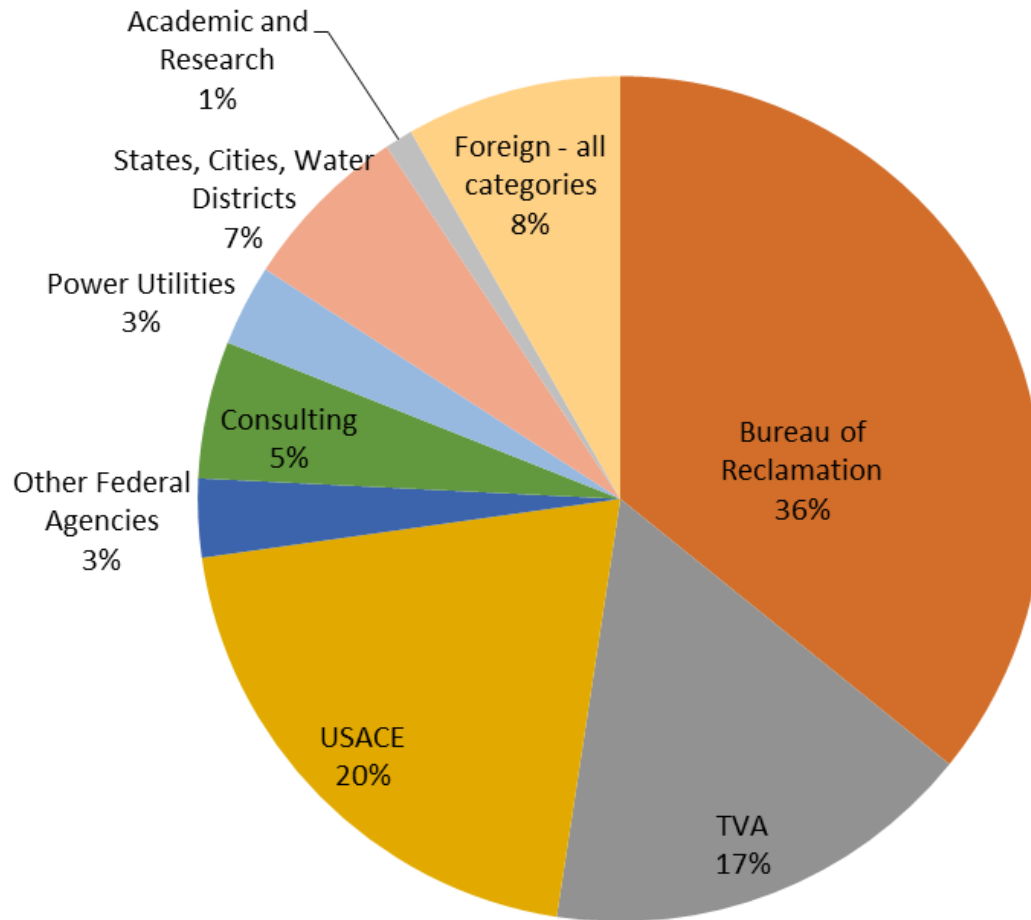
News and Updates

Presenter: Edie Zagona

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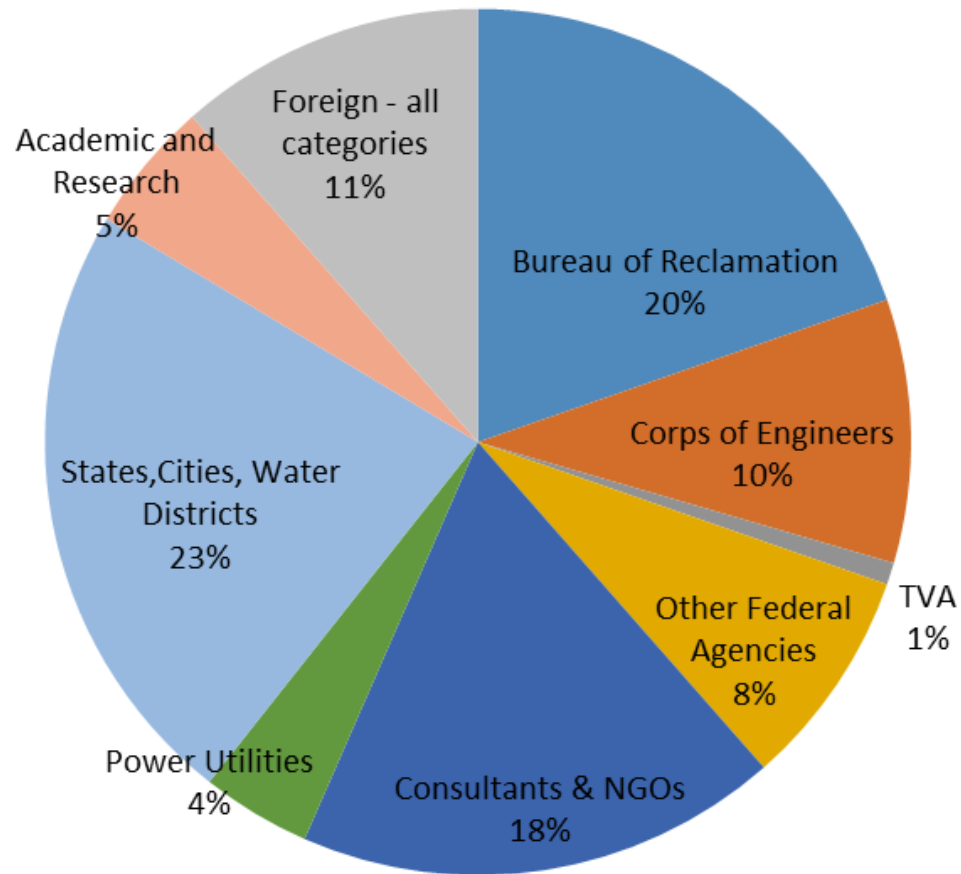
Who Uses RiverWare?

RiverWare Licenses - approximately 950 seats



Who Uses RiverWare?

RiverWare Licensed Entities - 122 Total



RiverWare Licenses

Bureau of Reclamation (25 offices)

- Upper Colorado Regional Office
 - Albuquerque AO, Provo AO, Western Colo. AO, Durango Four Corners, El Paso FO
- Lower Colorado Regional Office,
 - Yuma Area Office, Boulder Canyon Operations Office
- Great Plains Regional Office
 - Eastern Colorado AO, Montana AO, Pueblo AO, Oklahoma-Texas AO
- Mid Pacific Regional Office
 - Lahontan Basin AO, Klamath Basin AO, South-Central California AO
- Pacific Northwest Regional Office
 - Columbia Cascades AO, Ephrata FO, Snake River AO, Upper Snake FO
- Technical Service Center - Denver

RiverWare Licenses

Tennessee Valley Authority – River Operations, Knoxville, TN

U.S. Army Corps of Engineers (12 offices)

Albuquerque District, Boise Outreach Office, New England District
Ft. Worth District Kansas City District, Little Rock District
Portland District Sacramento District Seattle District
Tulsa District Walla Walla District
Hydrologic Engineering Center (HEC)

10 Federal Agencies and research labs

28 State, City and District Water Agencies

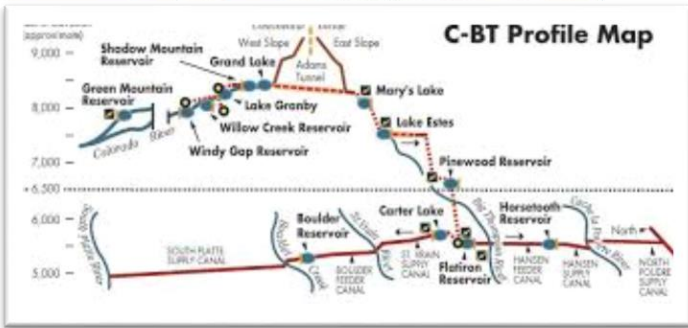
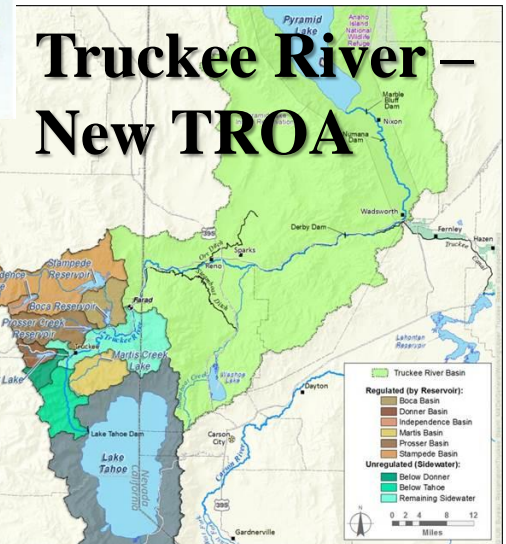
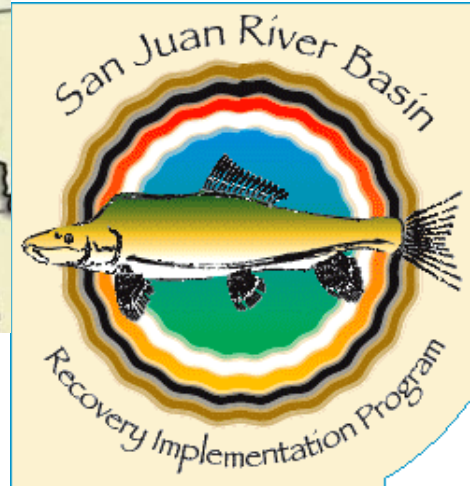
8 Electric Utilities – US and Canada

22 Consulting companies and NGOs

8 Universities and research labs

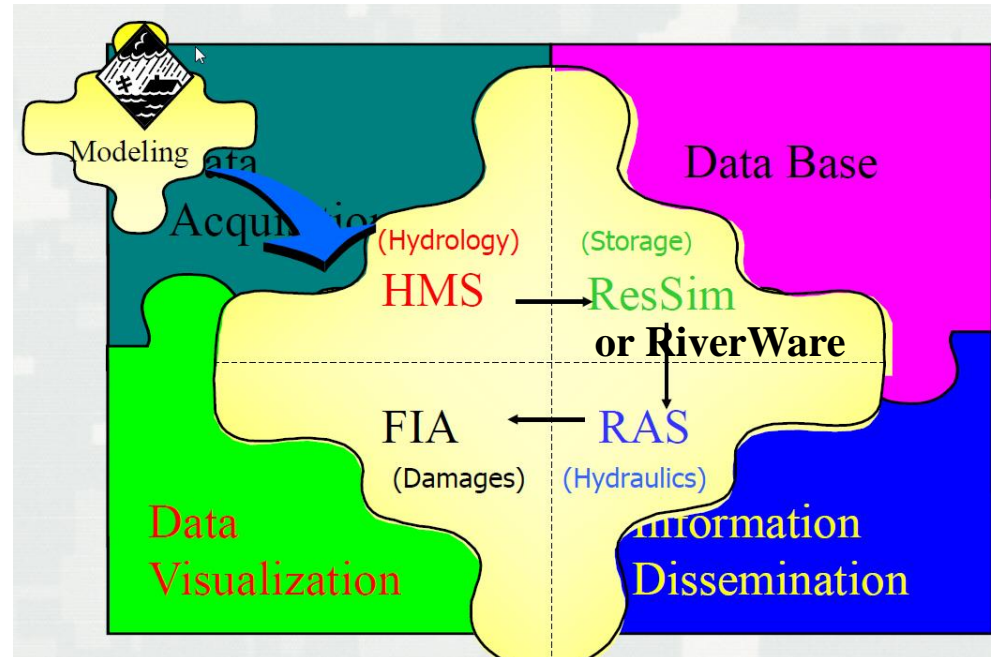
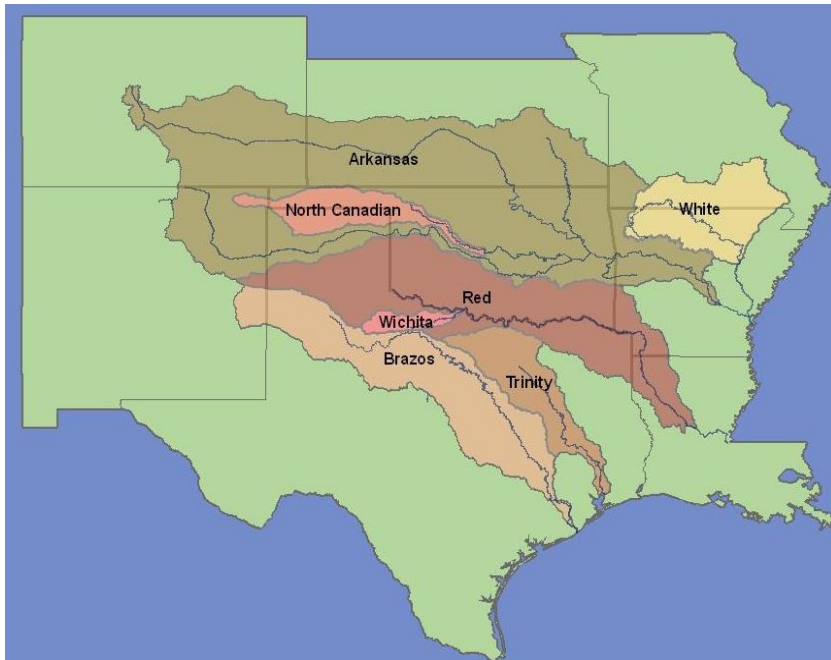
13 Foreign Entities

Applications throughout Reclamation



Applications: USACE SWD

- Continued use of long term planning models for yield, flood control policy, changing operational criteria

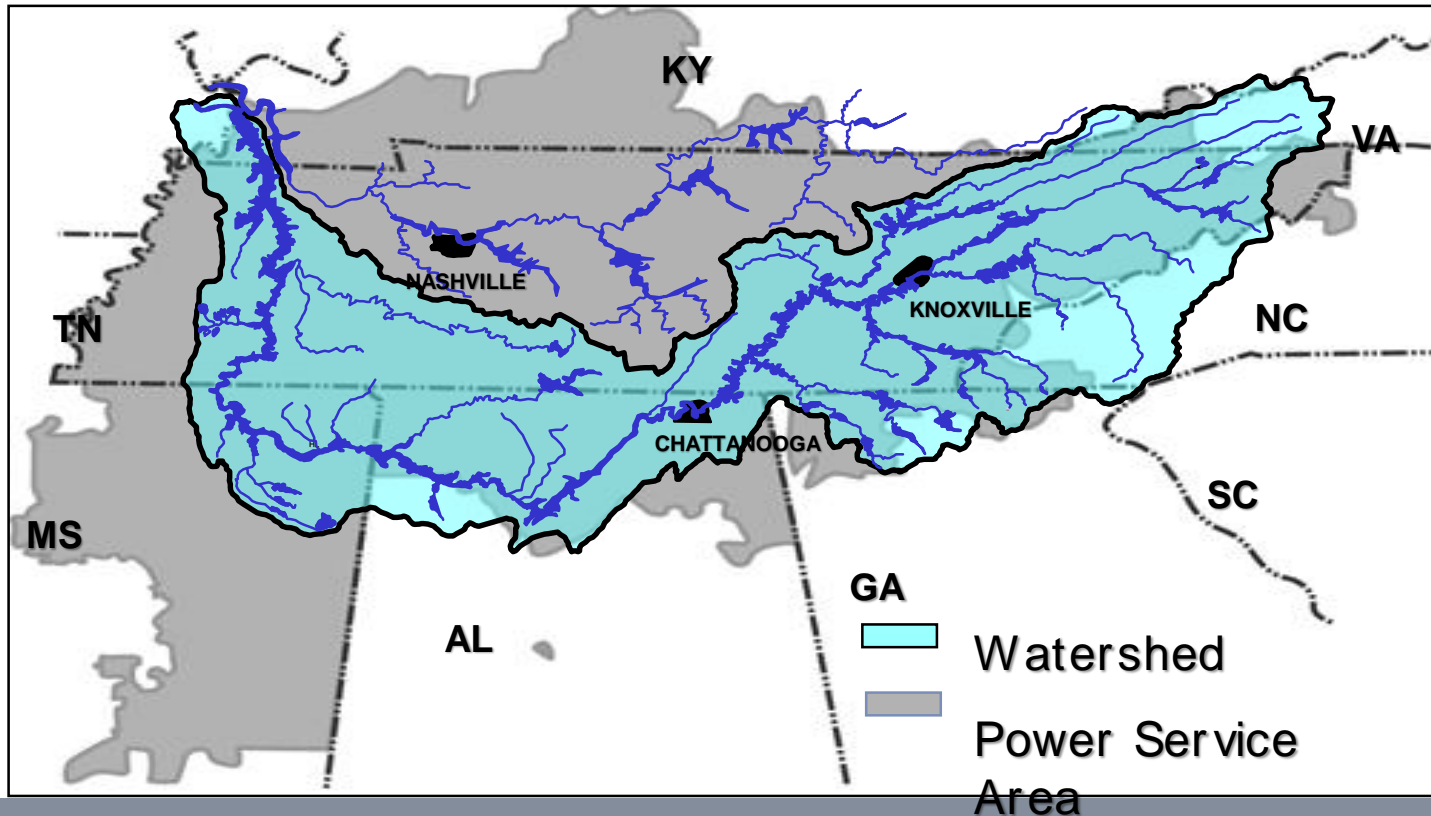


Corps Water Management System (CWMS)

- Starting to move into more Operations type models

Tennessee Valley Authority

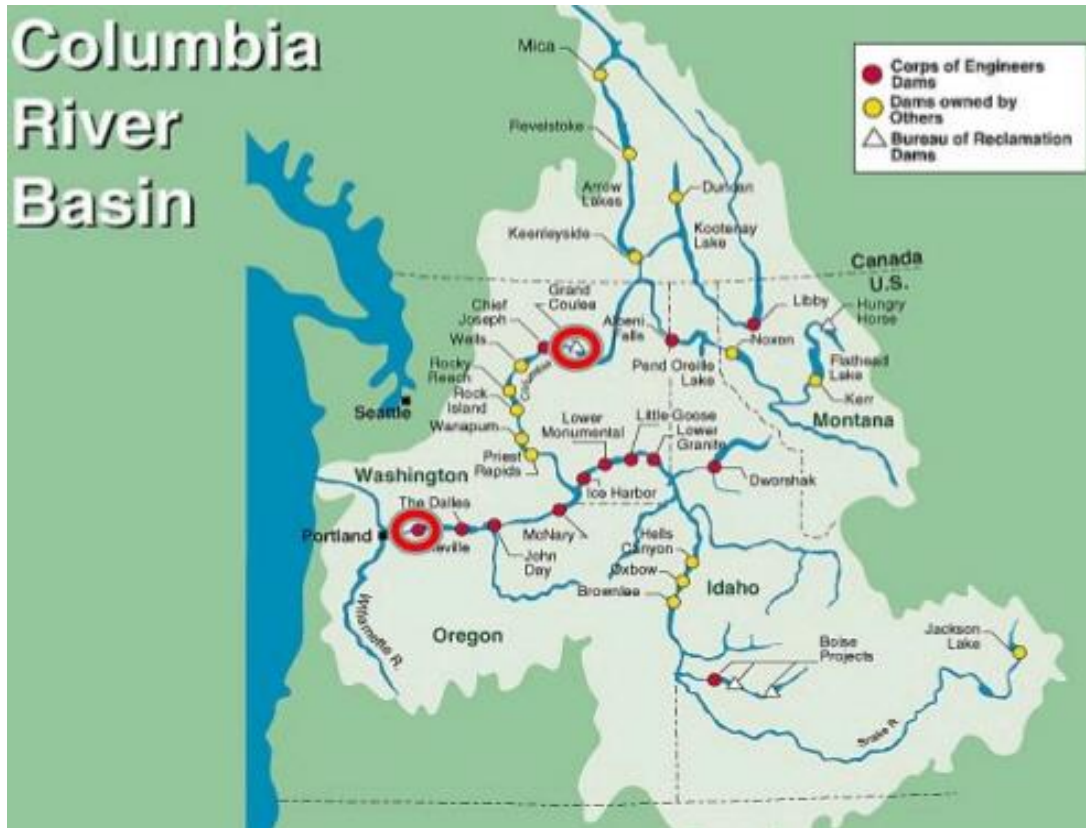
- Daily and hourly operations, hydropower optimization, flood study
- New FEWS System



Bonneville Power Administration



Operates the Federal Columbia Power System



New Application:
RiverWare for real
time and short term
operations – “going
live” in September

BPA funded FEWS
adapter and many
enhancements to
RiverWare’s optimization
modeling

Nile Basin – Cooperative Filling Strategies for the Grand Ethiopian Renaissance Dam (GERD)

Kevin G. Wheeler^a, Mohammed Basheer^b, Zelalem T. Mekonnen^c, Sami O. Eltouni^d, Azeb Mersha^e, Gamal M. Abdo^b, Edith A. Zagana^f, Jim W. Hall^a and Simon J. Dadson^g



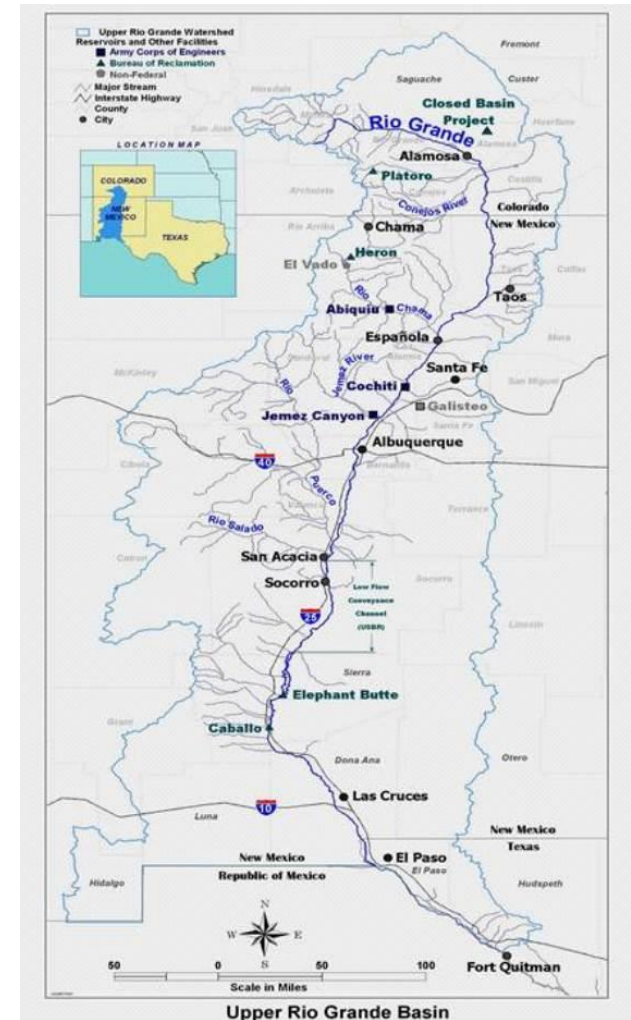
Quantifies tradeoffs among hydropower, risk of shortage for Ethiopia, Sudan and Egypt; suggests some international cooperation strategies
(RiverWare now licensed by the 3 countries)

Big basin Multi-objective: Upper Rio Grande

Headwaters in Colorado all the way to Texas

- Water Rights and Water Accounting
- Salinity Modeling and Groundwater
- Soil Moisture Modeling throughout
- One daily After the Fact Accounting model that is converted to various applications
 - Long term planning
 - Annual operating plan
 - Monthly Timestep planning model

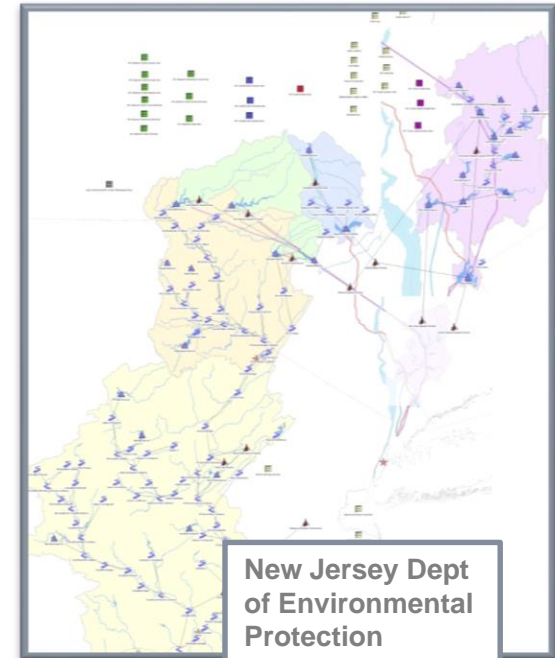
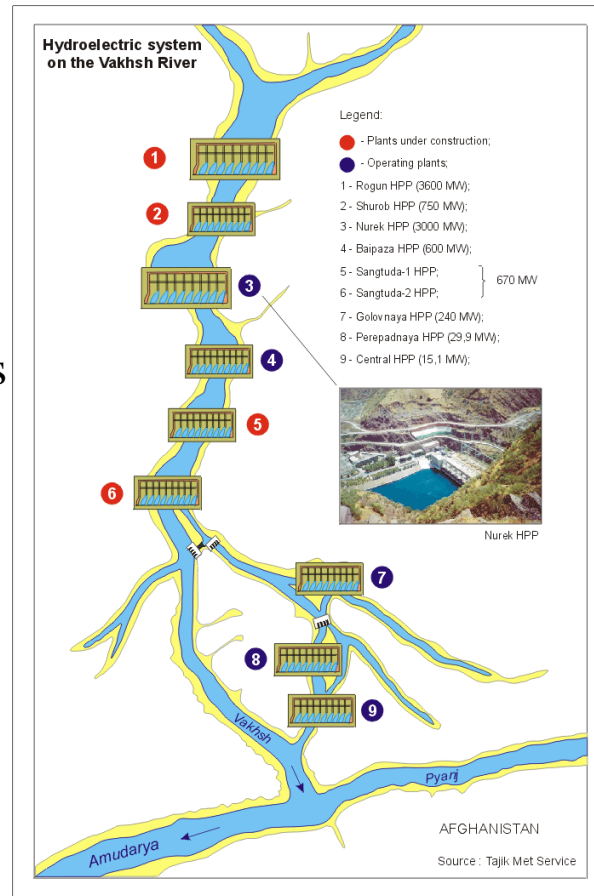
Bureau of Reclamation, USACE, USGS, New Mexico Interstate Stream Commission; many consultants



Other interesting and evolving applications....

Manitoba Hydro International is managing installation of RiverWare for Barqi Tojik, operators of the **Vakhsh River in Tajikistan**. Goal to optimize for hydropower and irrigation.

- Transboundary rivers
- Fed by glaciers (CC)
- HP for local and export to Afghanistan, Kazakhstan
- Iranian power brokers
- Major agricultural area
- Drains eventually to the Aral Sea

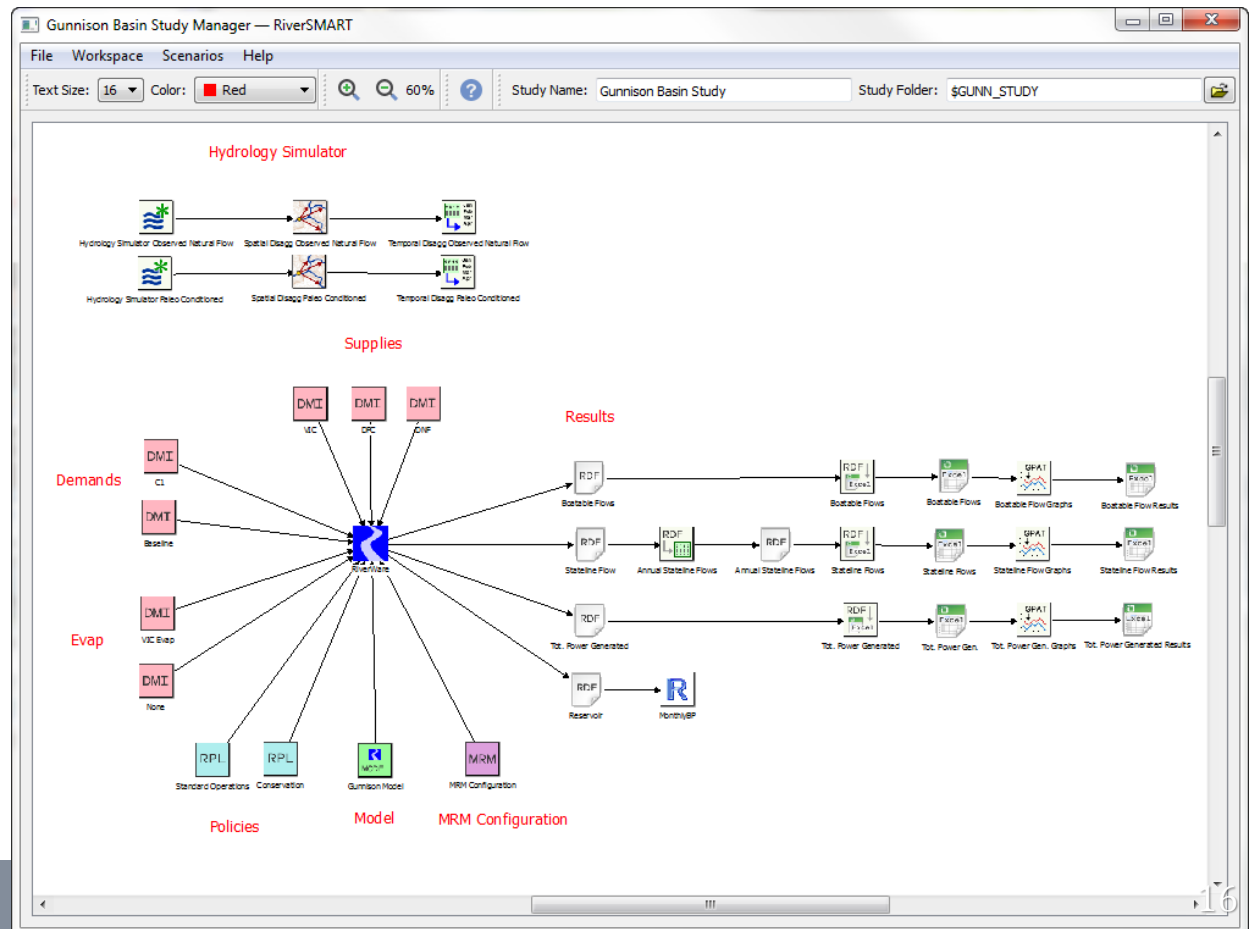


**New Jersey Dept of Environmental Protection
New York City and Delaware River Basin
Surface Water Supply Systems**

RiverWare Study Manager and Research Tools (RiverSMART)

Facilitates large studies with many combinations of inputs by organizing and executing scenarios

- Develop Scenarios that consist of combinations of alternative
- Provide Graphical Representation
- Manage Execution
- Organize Outputs
- Archive the study



Future Directions?

Help us identify user needs....

- Cloud computing
- Web Maps and Web Viewers
- Scenario Stakeholder Interaction
- Integration into data/model frameworks (RiverSMART, FEWS, CHPS, CWMS, DHI Customized)
- More powerful and flexible hydropower optimization
- Simulation based optimization (MOEAs)
- Easier post-processing
- Database Connections

